BARNEY LAKE

Introduction

Barney Lake is east of Marysvale on the Sevier Plateau. It was acquired by the DWR in 1988 to be managed as a stabilized lake. The dam was rebuilt in 1990,
and it now serves as an artificial lake for fishing and other recreation. It is very remote. It should not be confused with like-named Barney Lake on the Aquarius Plateau.

Barney Lake is a small, shallow natural lake that was regulated with a dam in 1914. The reservoir shoreline is publicly owned and administered by the Fish Lake National Forest with unrestricted public access. Reservoir water is used for coldwater aquatic habitat and recreation, but is not drained for agricultural purposes. No changes in water use are expected.

Characteristics and Morphometry

Lake elevation (meters / feet)	3,064 / 10,049
Surface area (hectares / acres)	7.6 / 19
Watershed area (hectares / acres)	119 / 293
Volume (m^3 / acre-feet)	
capacity	247,000 / 200
conservation pool	247,000 / 200
Annual inflow (m^3 / acre-feet)	not measured
Retention time (years)	unknown
Mean annual vertical fluctuation (m^3 / acre-feet)	0 / 0
Depth (meters / feet)*	
maximum	5 / 16.4
mean	3.2 / 10.5
Length (meters / feet)	300 / 1,000
Width (meters / feet)	120 / 400
Shoreline (meters / feet)	850 / 2,800

Location

County	Piute
Longitude / Latitude	112 05 11 / 38 29 04
USGS Map	Marysvale Peak 1981
DeLormes Utah Atlas and Gazetteer™	Page 27, A-4
Cataloging Unit	Richfield (16030002)

Recreation

Barney Lake is not readily accessible. From the west or the north, access is from Monroe via FS-078. Go south, then southeast out of town, following signs to Monrovian

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Park. At Monrovian Park, continue on FS-078 as it turns to gravel and climbs to the top of the plateau. About 7 miles past Monrovian Park, the Paiute ATV trail joins the route, and 12 miles past Monrovian Park the road (FS-083) to Manning Meadows Reservoir and Barney Lake branches to the right.

From the east, take the gravel road 1/2 mile north of the Greenwich church (on U-62 6 miles south of Koosharem) to the west and up onto the Sevier Plateau and becomes FS-069. The Paiute ATV Trail follows this route. Approximately 1 mile past the turn off to Lower Box Creek Reservoir, turn right on FS-078. Proceed to the junction of FS-078 and FS-083, approximately 3-4 miles.

From the FS-078/FS-083 junction, go several miles south on FS-083, past Manning Meadows Reservoir, to the turn off to Barney Lake. The road to the reservoir is approximately 1/2 mile long.

Fishing, backpacking and camping are possible in the area. Usage is light. There are no recreational facilities at the reservoir, although the area offers itself to primitive camping. Please respect this site and carry out all of your trash. Bury human wastes at least 8" deep and at least 300' from the nearest body of water.

There are no improved Forest Service Campgrounds in the area, and the nearest private campgrounds are in Koosharem and Monroe (see info box).

Watershed Description

The reservoir is in an area of high, rolling ridges and valleys characteristic of the top of the Sevier Plateau. The watershed is quite small, and can be seen in its entirety from the reservoir. Vegetation is spruce-fir and aspen down the reservoir shoreline.

The watershed high point, the east shoulder of Marysvale Peak, is 3,330 m (10,925 ft) above sea level, thereby developing a complex slope of 21.4% to the reservoir. There are no perennial inflows to Barney Lake.

The soil is largely of volcanic origin with moderate permeability and moderately slow erosion and runoff.

The vegetation communities are comprised of aspen, spruce-fir and sage-grass. The watershed receives 64 - 76 cm (25 - 30 inches) of precipitation annually with a frost-free season of 20 - 40 days at the reservoir.

Land use is entirely multiple use USFS land.

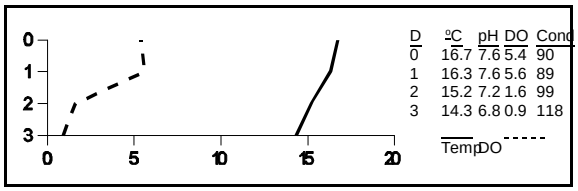
Limnological Assessment

The water quality of Barney Lake appears to be fairly good. The water is considered soft with a hardness concentration of 38 mg/L. Barney Lake is currently not classified, but will be compared to the water quality standards for 2B, 3A and 4 class waters. These are the typical beneficial classifications for most impoundments in the State. A comparison of current lake water quality data against the State standards for these classes of water indicates that there are no exceedences except for phosphorus which exceeds the recommended maximum concentration of 0.25 mg/L. The dam was reconstructed in 1990 and with the impoundment of water, nutrient concentrations are currently moderate to high. This may be a temporary condition due to recent impoundment of water over newly disturbed area or the suspension of nutrients from deposition of waste materials from animals grazing in the area. Currently there is insufficient data available to make a definite categorization of the water quality associated with the productivity for this lake. This relatively high concentration of nutrients provided for a relatively high biological production in the lake during 1992. This is not uncommon for newly impounded waters and may be reduced as the lake reaches a greater state of equilibrium. This will have to be assessed as the program continues. The lake was considered to be a nitrogen limited system in 1992 with an average total phosphorus concentration in the lake of

Limnological Data

Data sampled from STORET site: 594495

Surface Data	1992
Trophic Status	H
Chlorophyll TSI	58.25
Secchi Depth TSI	60.00
Phosphorous TSI	66.12
Average TSI	61.46
Chlorophyll a (ug/L)	16.8
Transparency (m)	1.0
Total Phosphorous (ug/L)	73.5
pH	8
Total Susp. Solids (mg/L)	2.3
Total Volatile Solids (mg/L)	1.0
Total Residual Solids (mg/L)	2.3
Temperature (°C / °f)	16/61
Conductivity (umhos.cm)	87
Water Column Data	
Ammonia (mg/L)	0.08
Nitrate/Nitrite (mg/L)	0.01
Hardness (mg/L)	37.8
Alkalinity (mg/L)	37.0
Silica (mg/L)	11
Total Phosphorus (ug/L)	107
Miscellaneous Data	
DO (Mg/l) at 75% depth	1.4
Stratification (m)	1-2
Limiting Nutrient	N
Depth at Deepest Site (m)	3.0



0.108 mg/L and the inorganic nitrogen concentration was only 0.09 mg/L.

Although the lake profile indicates that there is by definition, a theoretical stratification between 1 and 2 meters depth, the lake had a maximum depth of 3 meters which is probably well mixed the majority of time and not stratified. The dissolved oxygen concentrations at the time of sampling on August 5, 1992 were fairly low (0.9-5.4 mg/L). The data was collected early in the morning and may reflect the morning sag present due to the respiration requirement from the high algal biomass that may have been present. The current established trophic state for the reservoir is hypereutrophic. It is anticipated that a moderation of this trophic state will occur in the future. Currently DWR stocking records indicate that in 1992 the lake was stocked with fry bonneville cutthroat (*Oncorhynchus clarki utah*) and fingerling tiger trout (*Salvelinus fontinalis X Salvelinus namaycush*) a brook-brown trout cross. In addition brook trout (*Salvelinus fontinalis*) have been stocked at times in the lake. This small lake is noted for its tiger trout fishery, a unique fishing experience in Utah. The DWR has not treated Barney Lake for rough fish control, so native fish populations may still be found.

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm^3/liter)	% Density By Volume
Aphanocapsa pulchra	55.600	42.84
Volvox areus	44.480	34.28
Aphanizomenon flos-aquae		18. 6 9 8 14.41
Anabaena spiroides var. crassa	5.782	4.46
Sphaerocystis schroeteri	2.641	2.04
Coelastrum sp.	1.112	0.86
Pennate diatoms	0.475	0.37
Euglena sp.	0.453	0.35
Centric diatoms	0.247	0.19
Haematococcus sp.	0.140	0.11
Unknown flagellate	0.050	0.04
Chlamydomonas globosa		0. 0 4 6 0.04
Scenedesmus bijuga	0.034	0.03
Oscillatoria sp.	0.012	0.01
Ankistrodesmus falcatus	0.004	0.00
Total	129.774	
Shannon-Weaver [H']	1.34	
Species Evenness	0.49	
Species Richness [d]	0.56	

The phytoplankton community is dominated by the presence of blue-green algae indicative of poorer water quality and high productivity.

Pollution Assessment

Nonpoint solution includes grazing and recreation. Domestic livestock graze in the watershed and in the vicinity of the reservoir.

There are no point pollution sources in the watershed.

Beneficial Use Classification

This lake currently is not classified but the expected state beneficial use classifications include: boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).

Information

Management Agencies	
Fish Lake National Forest	896-4491
Richfield Ranger District	896-4491
Six-County Commissioners Association	896-9222
Division of Wildlife Resources	586-2455
Division of Water Quality	538-6146
Recreation	
Koosharem Campground, Cafe	638-7310
Monroe Hot Springs Resort	527-4014
Reservoir Administrators	
Division of Wildlife Resources	586-2455